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Estimation of Economic Values of Productive Traits in Taleshi Sheep of Iran

Research Article

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ABSTRACT

In order to estimate economic values of productive traits (meat, milk and wool) in Taleshi native sheep breed of Iran, records from economic parameters and performance of local Taleshi flocks were used. The economic values of traits were used to select the maximum profit estimation also to study the sensitivity rate of the model the effects of 20 percent increase / decrease in the price of milk feed and other costs were estimated. Average values of estimated absolute economic values for meat, wool and milk were 1229798.139, 833959.858 and 27174.717 Iranian Rial (IRR)/kg, respectively. Life analysis of economic values showed that these values were changing and sensitive to the variable management and nutrition costs, although they were less affected by the change in total cost of the growing system of Taleshi sheep.

KEY WORDS economic value, meat, milk, Taleshi sheep, wool.

INTRODUCTION

The human population is growing fast which it seems that in spite of the recent progresses in new issues and technologies, they are not enough to fulfill feed requirements of humankind. Planning a suitable breeding system would be an important practical method in using the production potential of local sheep flocks. Therefore, it is essential to estimate economic values of production traits in a one or multivariate selection scheme to evaluate the priority incomes and costs of a breeding system. Harris and Newman (1994) explained a production system and formulated system objectives for the main steps of a breeding program in sheep. Panzoni (1988) and Groen *et al.* (1997) mentioned that determination of breeding objectives and evaluation of economic values, are prior criteria in developing the breeding objectives. Taleshi sheep is a good quality mutton-producing breed with long wool fibers, however, it has small tallow. These potentials are of an importance in sheep industry in Iran. According to the extensive breeding system, there is a necessity for identifying the productive potential and economic efficiency of this breed. It will improve economic production and income of Taleshi sheep in rural areas. In order to accomplish these objectives, the present study was conducted to estimate economic indexes, sensitivity of values in selection for maximum profit using simple explanatory models of extensive breeding system in Iran.

MATERIALS AND METHODS

In order to estimate economic values, information from total costs and incomes from 40 local Taleshi flocks in 2011 were used (Research state of Taleshi sheep, Gilan province, Iran). To investigate the effect of different economic and production factors on the economic values, a

population of Taleshi sheep was simulated. The structure of this population was male and female sheep, 3 month-olds, 4 to 11 months-olds, culled and 12 to 18 months-old replacement lambs. Since there were seasonal differences affecting the performance of animals and costs, mean value of measures were calculated. The income was consisted of money from selling wool, culled animals (male and female) and dairy products. Costs were consisting of fixed and variable cost (nutrition and raising, husbandry, salary of workers, sanitation and wool shearing, as non-nutrition variables).

Milk, wool and meat production were traits considered for studies. The equation of yearling income of flocks was as follows:

$$P_{flock} = N_f (R_f - C_f) - C_{FCF}$$

Where:

P_{flock}: yearling income from the flock.

N_f: number of stud ewes.

R_f and C_f: incomes and costs, respectively from one sheep, in a year.

C_{FCF}: yearling constant cost of the flock.

RESULTS AND DISCUSSION

Table 1 represents the parameters of the model and Table 2 summarizes the costs of nutrition and non-nutrition factors for each group. In order to estimate economic values, the standard method and maximum income trend, the partial derivative of the profit equation for each trait were used. In a semi-intensive system, current costs explained 98 percent of total costs. Vatankhah (2005) studied the rural system of Lori Bakhtiari sheep and reported that current costs were 97.65 percent of total costs; Molayi-Moghbeli (2005) mentioned 98.60 percent in Raeini goat.

Nutrition costs were estimated 37 percent and 38 percent of the total and current costs, respectively. However, non-nutrition costs were 61 and 62, respectively. It was in agreement with the results reported by Molayi-Moghbeli (2005) in Raeini goats and Kosgey *et al*. (2001) in tropical sheep breeds.

The difference was likely due to the raising system of Taleshi sheep was more dependent on pasture, then the feeding costs were low and sanitation costs were more. It may be noted that because of the local husbandry, the shares of constant costs only explained 2 percent of total costs. In the present study, income from selling meat, wool and milk / dairy products, were 48, 37 and 15 percent of total income, respectively. In maximum income trend, the economic values of meat, wool and milk were 1229798.139, 833959.859 and 27174.717 IRR, respectively, which meat production had the highest value and wool and milk were at second and third levels.

Table 1 Mean values of production and management parameters used for model from studied folks

	Unit	Mean	SD
Number of animals	Head	331	100
Number of stud animals	Head	106	40
Meat production (as percentage of live body weight)	%	0.45	0.4
Price of live animal (meat)	kg	18000	1000
Dairy production (milk, cheese, …)	kg	40	15
Price of dairy production	IRR/kg	3500	-
Wool production (male/female/yearling)	kg	1.10 / 0.70 / 0.40	- / - / 0.12
Price of wool	IRR/kg	150000	500
Salary of shepherd per animal	IRR	85000	1500
Pregnancy duration	Day	150	-
Milking duration	Day	120	-
Costs of sanitation per animal	IRR	9000	510
Costs of shearing	IRR/day	5000	-
Number of sheared animals per day	Head	20	4
Costs of feeding lambs	kg	-	-
Costs of feeding ewe and ram	kg	-	-
Costs of husbandry	IRR	42000000	-
Cost of feed/kg	IRR	3500	-
Number of stud ewes	Head	106	50
Number of stud rams	Head	2	-
Number of non fertilizing ewes	Head	6	4
Mortality of ewes/year	%	9	-
Mortality of rams/year	%	0.5	-
Numbe of burned lambs per year	Head	105	-
Number of weaning lambs	Head	97	-
Mortality of lambs before weaning	%	8	-
Mortality of weaned lambs	%	5	-
Mortality of lambs after weaning	%	3	-
Number of culled ewes	Head	-	-
Number of culled rams	Head	-	-
Soled animals	Head	-	-
Average birth weight	kg	2.6	0.45
Average weaning weight	kg	10	-
Average yearling weight	kg	24	5.88
Average weight of replace animals	kg	45	6.5
Average weight of culled animals	kg	35	10.5
Average weight of stud ewes	kg	45	5.5
Average weight of stud rams	kg	55	1.2
Average age of rams	Year	2.5	-
Average age of ewes	Year	6	-
Number of ewes with twins	%	17	5
Number of ewes with one lamb	%	83	14

SD: standard deviation.
IRR: Iranian Rial.

The sensitivity of the system to the level of input / products was estimated which showed that the index would be useful for genetically improving of production system in the future.

Table 2 Incomes and costs per animal group and yearly profit of flock

	Groups	Stud ewes	Stud rams	Lambs (0-3)	Yearling (4-11)	Culled	Replace (12-18)	Total
	Number of animals	106	2	94	84	23	22	331
Costs	Feeding	4424798.23	216743.29	3845432.98	3923388.30	1197918.90	971519	14579801
	Raising	14331700	271500	282000	5779200	417300	2945800	24027500
	Constant	-	-	-	-	-	-	880000
	Total	18756498	488243.29	4127432.98	9702588.30	1615218.90	3917319	39487300.94
Incomes	Meat	1250291.2	352800	0	27783000	15214500	0	44600591
	Dairy	24804000	0	0	0	0	0	24804000
	Wool	12614000	408000	0	10500000	3128000	3520000	30170000
	Total	38668291	760800	0	38283000	18342500	3520000	99574591
Profit		19911793	272556.71	-4127432.99	28580412	16727281	-397319	60087290.26

Change in economic values of traits according to the ±20 percent changes in the cost of inputs, base total price (Table 3), feed costs (Table 4), non nutrition costs (Table 5) and in base constant prices (Table 6) were evaluated.

Table 3 Economic value of production traits in different trends with 20% change in base price of costs

Economic trend	Trait	+20 %	Base	-20 %
Maximum profit[1]	Meat	189175.181	122979.139	1223095.107
	Wool	718566.445	833959.858	839353.273
	Milk	18644.625	27174.717	35704.151

[1] Economic value of production traits (meat, wool and milk) in maximum profit (IRR/kg).

Table 4 Economic value of production traits in different trends with 20% change in price of nutrition costs

Economic trend	Trait	+20 %	Base	-20 %
Maximum profit[1]	Meat	182472.138	1229798.139	1029798.139
	Wool	723959.859	833959.858	633959.314
	Milk	27174.952	27174.717	29174.012

[1] Economic value of production traits (meat, wool and milk) in maximum profit (IRR/kg).

Table 5 Economic value of production traits in different trends with 20% change in price of non-nutrition costs

Economic trend	Trait	+20 %	Base	-20 %
Maximum profit[1]	Meat	209175.171	1229798.139	1200095.107
	Wool	812566.411	833959.858	619353.273
	Milk	19644.817	27174.717	45704.717

[1] Economic value of production traits (meat, wool and milk) in maximum profit (IRR/kg).

Table 6 Economic value of production traits in different trends with 20% change in constant costs

Economic trend	Trait	+20 %	Base	-20 %
Maximum profit[1]	Meat	1229798.139	1229798.139	1229798.139
	Wool	833959.858	833959.858	833959.859
	Milk	27174.717	27174.717	27174.717

[1] Economic value of production traits (meat, wool and milk) in maximum profit (IRR/kg).

Tables 3-6 represent that in maximum profit trend and with a 20 percent decrease in costs, change in economic values, also change in the level of economic values would not be considerable. Table 6 shows that ±20 percent of change in constant costs had no significant effect on the sensitivity of estimated values in a maximum profit trend. Otherwise, 20 percent increase in current and feed costs, made a considerable change in estimated values and of the level of values.

CONCLUSION

This work has provided a base from which to define the economic limitations to genetic improvement in pasture environments for sheep. Genetic improvement in pasture environments is likely to be of greater benefit to farms with fewer constraints to improvements in production, such as better-quality hill grazing land. For farms in this location, the economic value of improving litter size was only positive within defined production limits. There is little economic reward to genetic improvement programs beyond these limits because the cost of production outweighs the benefits of extra financial returns. An application of this generic methodology would be for animal production systems where environmental factors play a major role in the suitability of different genotypes. It is important in such situations to model the true importance of each trait, the implications of changing the environment, and of changing the genotypes.

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REFERENCES

Groen A.F., Steine T., Colleau J.J., Pederson J., Pribyl J. and Reinsch N. (1997). Economic values in dairy cattle breeding with special referenceto functional traits. *Livest. Prod. Sci.* **49,** 1-21.

Harris D.L. and Newman S. (1994). Breeding for profit: synergism between genetic improvement and livestock production: a review. *J. Anim. Sci*. **72,** 23-29.

Kosgey I.S., Arendonk J.A.M.V. and Baker R.L. (2001). Breeding objectives for meat sheep in smallholder production systems in the tropics. Paper at 52nd meet. European Assoc. Anim. Prod., Budapest, Hungary.

Molayi-Moghbeli S. (2005). Introduction of a bio-economic model in Raeini goat. MS Theses. Department of Agriculture. Univ., Mazandaran. Iran.

Vatankhah M. (2005). Determination of a suitable model for breeding of Lori-Bakhtiari sheep in rural system. MS Theses. Department of Agriculture Univ., Tehran. Iran.